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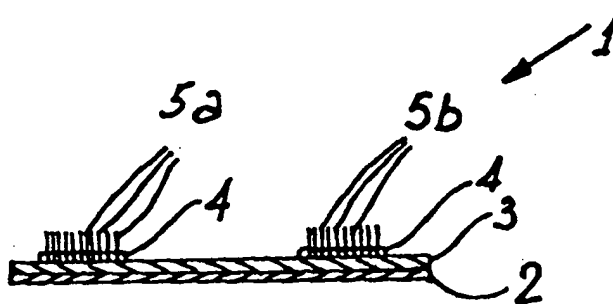
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: <b>PCT/IE94/00008</b> (22) International Filing Date: <b>22 February 1994 (22.02.94)</b> (30) Priority Data: <b>930122</b> <b>22 February 1993 (22.02.93)</b> <b>IE</b> (71) Applicant (for all designated States except US): <b>HIWELD LIMITED [IE/IE]; Commogue, Kinsale, County Cork (IE).</b> (72) Inventors; and (75) Inventors/Applicants (for US only): <b>KAY, Christopher [GB/IE]; Dromderrig, Kinsale, County Cork (IE). LION, Jean, Pierre [FR/FR]; 32, rue Chanteloup, F-53000 Laval (FR).</b> (74) Agents: <b>O'CONNOR, Donal, H. et al.; Cruickshank &amp; Co., 1 Holles Street, Dublin 2 (IE).</b>		(81) Designated States: <b>AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DE (Utility model), DK, DK (Utility model), ES, FI, GB, HU, JP, KP, KR, KZ, LK, LU, LV, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SK, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</b>  Published With international search report.

(54) Title: A LAMINATED ARTICLE

## (57) Abstract

An applique (1) comprises a support layer (2) of paper and a PVC base layer (3) on the support layer (2). Adhesive (4) is applied to the PVC layer (3) through a screen (20) so that the adhesive is only applied to those areas of the base layer (3) on which a desired motif is to be formed. First coloured flock fibres (5a) are flocked



into the adhesive (4) through a screen (21) and second coloured flock fibres (5b) are then flocked onto the adhesive (4). After curing, the sheet is cut up into individual appliques (1). To apply the applique to a substrate such as a garment (10), the support layer (2) is peeled off and the PVC layer is welded to the garment (10) by high frequency welding using a die (13).

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"A Laminated Article"

The invention relates to laminated articles and in particular to an applique for applying to fabric garments and other textile substrates.

5 An applique comprising an adhesive polyvinylchloride material laminated onto a paper backing sheet which is then fully flocked in a single colour flock material is known. The flock fibres may be screen printed, in the case of a multicoloured article, with desired colours to form a required badge or motif. The sheet and flock is  
10 then cut up into individual badges or motifs for application by high frequency welding to a textile substrate.

There are a number of problems with such conventional appliques. The main difficulty is the processing  
15 difficulty involved in screen printing a desired image onto the flock material. Different coloured inks are required which must be applied in a number of different stages and the badge thus formed must be cured at high temperature. Conventionally, the flock fibres are of  
20 rayon viscose 1.7 DTEX 0.5mm flock which is adapted to receive the necessary screen printing ink. The abrasion resistance of the badge thus formed is often not satisfactory. Further, the colours in the badge are often not sufficiently stable in repeated machine washing of the  
25 garment to which the badge is applied. In addition, the fibres have a relatively rough feel and consequently often detract from the feel of the garment to which they are applied. The applied print has a stiff mounting handle on the fabric which also detracts from the product.

30 This invention is directed towards providing an applique which will overcome at least some of these difficulties.

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According to the invention there is provided an applique comprising:-

a base layer of plastics sheet material;

an adhesive applied to one side of the base layer; and

5 a layer of flock fibres which are flocked onto the adhesive in a desired motif or pattern.

10 In a preferred embodiment of the invention the fibres are flocked onto the adhesive through a screen having openings for the flock fibres corresponding to at least portion of the desired motif.

15 In one embodiment of the invention the flock fibres are of synthetic fibre, preferably polyamide fibre, most preferably of polyamide fibres 3.3 DTEX lmm. These fibres give a partially plush finish. In a preferred embodiment of the invention at least two and possibly several different coloured flock fibres are flocked onto the adhesive. Preferably flock fibres of different colours are applied in sequential flocking steps. For ease of processing preferably the fibres are flocked onto the adhesive in a desired motif or pattern through separate screens.

25 In a particularly preferred embodiment of the invention the applique includes a support layer on which the base layer is supported. This assists in achieving dimensional stability. For ease of removal, preferably the base layer is peelably attached to the support layer. In a preferred embodiment of the invention the support layer is of stiff paper material or similarly adapted substrate.

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In a preferred arrangement the adhesive is applied to the base layer only in the region to which the flock fibres are to be flocked. Preferably the adhesive is applied to the base layer through a screen.

- 5     The flock receiving adhesive is selected to be compatible with both the flock fibres and the base material. Typically the adhesive is compatible with the polyamide fibres and polyvinylchloride film material.

10     Typically the base layer is of polyvinylchloride film material which is suitable for fixing to a fabric by high frequency welding.

The invention also provides a method of forming an applique carrying a motif or badge to be applied to a fabric comprising the steps of:-

- 15     applying an adhesive to a base layer of plastics sheet material; and

flocking flock fibres of one colour onto the adhesive in a desired pattern.

- 20     Preferably there are at least two different coloured flock fibres and the method includes flocking flock fibres of at least several colour flock fibres onto the adhesive in a desired sequence to form a desired coloured motif.

- 25     Preferably the adhesive is applied to the base layer only in the region to which the fibres are to be flocked. Typically the adhesive is applied to the base layer through a screen.

In a preferred embodiment of the invention the flock fibres are applied to the adhesive through a screen.

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Typically there are at least two different coloured flock fibres which are applied to the adhesive in sequential flocking steps. Most preferably the coloured flock fibres are flocked onto the adhesive through separate screens.

- 5 Preferably the method includes the step prior to applying the adhesive, of providing a support layer for the thermoplastic base layer.

In one embodiment of the invention the adhesive is cured after application of the flock fibres.

- 10 The invention further provides a method of applying an applique according to the invention to a fabric support comprising the step of:-

- 15 removing the support layer, if present, and welding the applique to the fabric support by high frequency welding.

In a preferred arrangement the method further includes the step, prior to welding, of interposing a layer of foam or the like material between the base layer of the applique and the fabric support.

- 20 The invention will be more clearly understood from the following description thereof given by way of example only with reference to the accompanying drawings, in which:-

Fig. 1 is a diagrammatic cross sectional view of an applique according to the invention;

- 25 Fig. 2 is a diagrammatic cross sectional view illustrating the application of the article of Fig. 1; and

- 5 -

Figs. 3a to 3f are schematic drawings of various steps used in the method of the invention.

### Example

To form an applique in accordance with the invention a  
5 high frequency weldable plastics such as polyvinylchloride  
sheet or film having a thickness of between 0.15mm and  
0.30 mm forming a base layer is applied onto a support  
layer, preferably by a flow process in which the PVC in a  
liquid form is applied to the support layer. The support  
10 layer in the preferred arrangement is of a stiff paper  
material which allows the plastics film to be easily  
peeled off the support layer after processing.  
Furthermore, the application of the PVC onto a support  
layer facilitates the subsequent processing of the product  
15 whilst maintaining the dimensional stability of the PVC  
when subjected to heating.

A layer of permanent adhesive is applied to the upper side  
of the base layer of polyvinylchloride film material. The  
adhesive is applied through a screen only to the area of  
20 the base layer on which a desired motif or badge is  
required. The adhesive is compatible with both polyamide  
fibres and PVC.

Polyamide fibres of 3.3. DTEX 1mm are flocked onto the  
adhesive using conventional flocking techniques. The  
25 fibres are flocked onto the adhesive to produce a desired  
motif or badge on the polyvinylchloride base film. In the  
case of a multicoloured motif or badge the fibres are  
flocked onto the adhesive in a desired sequence using  
separate screens for each colour. The applique thus  
30 formed is then treated, typically at 160°C for  
approximately three minutes to cure the adhesive and to



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ensure permanent adhesion of the flock fibres to the base polyvinylchloride adhesive.

The sheet of flocked film material thus formed has a plurality of applique badges or motifs spaced-apart therealong. This sheet is then cut up into individual appliques which may be applied to textiles or other substrates, after removal of the backing paper using conventional high frequency welding techniques. If an additional three dimensional effect is required a layer of polyurethane foam may be interposed between the PVC film and the fabric to which the applique is to be attached. Referring to the drawings and initially to Fig. 1 there is illustrated an applique according to the invention and indicated generally by the reference numeral 1. The applique 1 comprises a support layer 2 of paper material coated with a release agent. A PVC base layer 3, which is typically 0.15 to 0.3 mm thick is applied, for example in a liquid form, onto the paper support sheet 2. An adhesive 4 which is compatible with the PVC sheet and with polyamide flock fibres 5 is then applied onto the PVC sheet 3 through a screen 20. The adhesive is a plastisol polyvinyl chloride based adhesive, made up of a PVC resin, with an appropriate plasticizer blend, and corresponding curing agents and stabilizer.

The polyamide flock fibres 5 are typically 1 mm 3.3 DTEX and are electrostatically flocked in one or more colours, in sequence, onto the pattern of the adhesive 4. The fibres are flocked onto the adhesive using a screen to achieve a desired motif or badge. In the case of a multicoloured badge or motif the fibres are applied sequentially through different screens for each colour fibre. In the particular case illustrated there are two different coloured flock fibres identified as 5(a) and

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5(b) which are flocked in sequence and in register with one another through separate screens 21, 22 respectively.

After flocking in sheet form and heat curing, each sheet is cut up into individual appliques.

- 5 Referring to Fig. 2 to apply an applique produced as described above, the paper base layer 2 is peeled off and the PVC sheet 3 is placed directly onto a textile fabric 10. The PVC is welded to the fabric by conventional high frequency welding techniques using a metal die 13.
- 10 Alternatively, a layer 12 of PVC foam material may be sandwiched between the textile substrate 10 and the PVC sheet 3 to achieve a three dimensional effect.

- After welding with the metal die 13, the excess parts of the PVC sheet are removed by peeling leaving the desired
- 15 applique welded to the textile substrate 10.

- The applique according to the invention is readily formed and applied and has improved colour fastness and stability after repeated machine washings of the garment to which it is applied. Further, the applique has superior tactile
- 20 properties to conventional appliques.

- The use of polyamide fibres pre-dyed by conventional techniques gives the substantial advantages mentioned above. In addition, the fibres have improved light fastness, wet and dry rubbing fastness and improved
- 25 abrasion resistance. The use of these fibres represents in particular a substantial improvement over fibres which are screen printed after application.

- As a consequence of these advantages the appliques of the invention may be used in high specification applications
- 30 such as in the motor vehicle industry. Conventional

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appliques have not heretofore been used in such industries because of the disadvantages of conventional products and processes.

The invention is not limited to the embodiments  
5 hereinbefore described which may be varied in both  
construction and detail.

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CLAIMS

1. An applique comprising:-  
  
a base layer of plastics sheet material;  
  
an adhesive applied to one side of the base layer;  
5 and  
  
a layer of flock fibres which are flocked onto the adhesive in a desired motif or pattern.
2. An applique as claimed in claim 1 wherein the fibres are flocked onto the adhesive through a screen  
10 having openings for the flock fibres corresponding to at least portion of the desired motif.
3. An applique as claimed in claim 1 or 2 wherein at least two different coloured flock fibres are flocked onto the adhesive.
- 15 4. An applique as claimed in claim 3 wherein flock fibres of different colour are applied in sequential flocking steps.
5. An applique as claimed in claim 3 or 4 wherein the fibres are flocked onto the adhesive in a desired motif or  
20 pattern through separate screens.
6. An applique as claimed in any preceding claim wherein the flock fibres are of synthetic fibre material.
7. An applique as claimed in claim 6 wherein the flock fibres are of polyamide fibre.

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8. An applique as claimed in claim 7 wherein the flock fibres are of polyamide fibres 3.3 DTEX 1mm.
9. An applique as claimed in any preceding claim wherein the adhesive is applied to the base layer only in  
5 the region to which the flock fibres are to be flocked.
10. An applique as claimed in claim 9 wherein the adhesive is applied to the base layer through a screen.
11. An applique as claimed in any preceding claim wherein the flock receiving adhesive is an adhesive which  
10 is compatible with both the flock fibres and the base material.
12. An applique as claimed in claim 11 wherein the adhesive is compatible with both polyamide fibres and polyvinylchloride film material.
- 15 13. An applique as claimed in any preceding claim wherein the base layer is of polyvinylchloride film.
14. An applique as claimed in any preceding claim wherein the applique includes a support layer on which the base layer is supported.
- 20 15. An applique as claimed in claim 14 wherein the base layer is peelably attached to the support layer.
16. An applique as claimed in claim 14 or 15 wherein the support layer is of stiff paper material.
- 25 17. An applique substantially as hereinbefore described with reference to the accompanying drawings.

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18. A method of forming an applique carrying a motif or badge to be applied to a fabric comprising the steps of:-

5 applying an adhesive to a base layer of plastics sheet material; and

flocking flock fibres onto the adhesive in a desired motif or pattern.

10 19. A method as claimed in claim 18 wherein there are at least two different coloured flock fibres and the method includes flocking second colour flock fibres onto the adhesive to form a desired coloured motif.

20. A method as claimed in claim 18 or 19 wherein the adhesive is applied to the base layer only in the region to which the fibres are to be flocked.

15 21. A method as claimed in claim 20 wherein the adhesive is applied to the base layer through a screen.

22. A method as claimed in any preceding claim wherein the flock fibres are applied to the adhesive through a screen.

20 23. A method as claimed in any preceding claim wherein there are at least two different coloured flock fibres which are applied to the adhesive in sequential flocking steps.

25 24. A method as claimed in claim 23 wherein the coloured flock fibres are flocked onto the adhesive through separate screens.

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25. A method as claimed in any of claims 18 to 24 including the step, prior to applying the adhesive, of providing a support layer for the plastics base layer.

5 26. A method as claimed in any of claims 18 to 25 including the step of curing the adhesive after application of the flock fibres.

27. A method of forming an applique substantially as hereinbefore described with reference to the accompanying drawings.

10 28. An applique whenever formed by a method as claimed in any of claims 18 to 27.

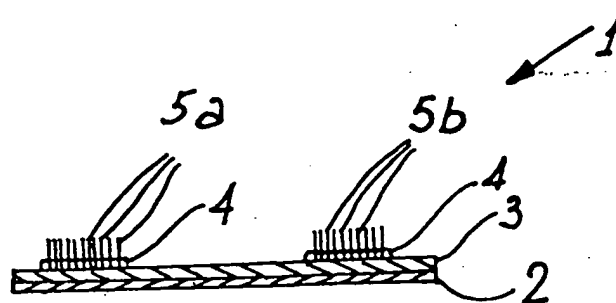
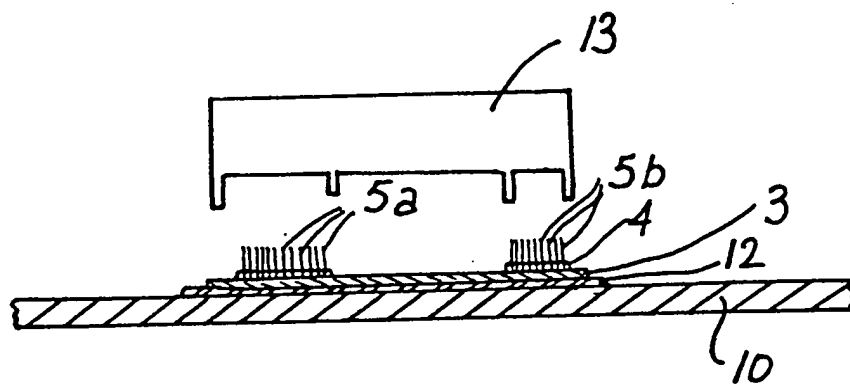
29. A method of applying an applique as claimed in any of claims 1 to 17 or 28 to a fabric support comprising the step of:-

15 removing the support layer, if present, and welding the applique to the fabric support by high frequency welding.

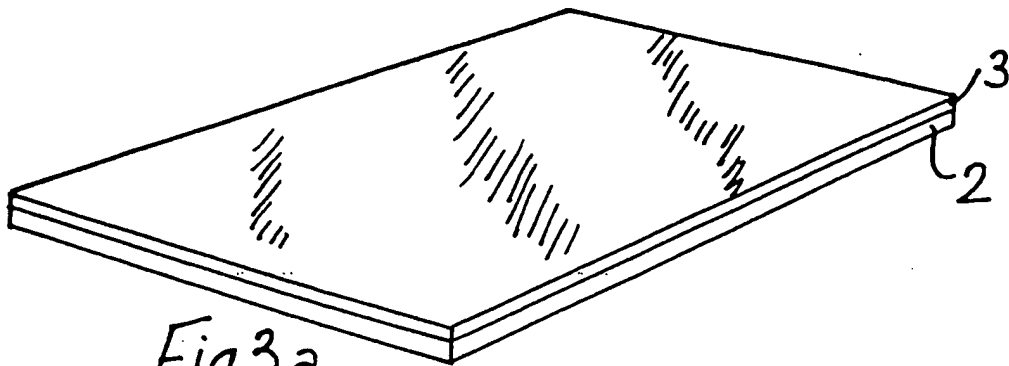
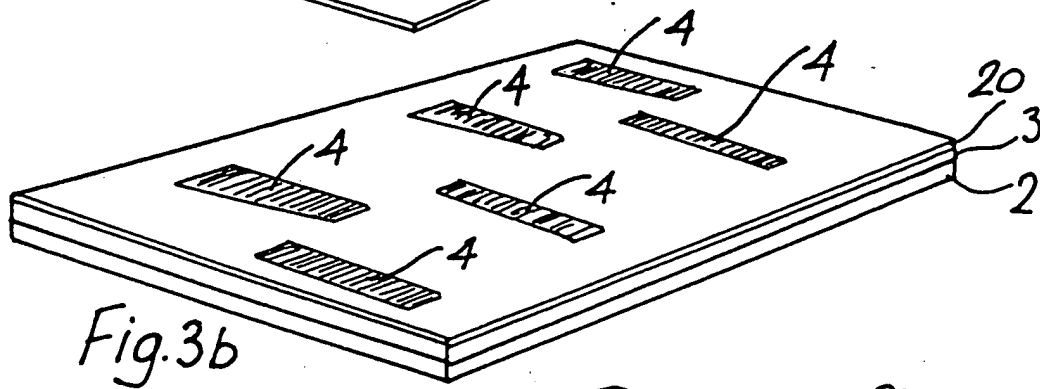
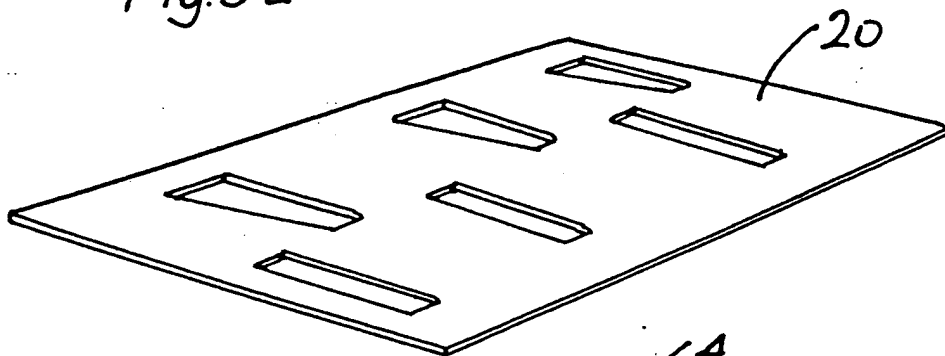
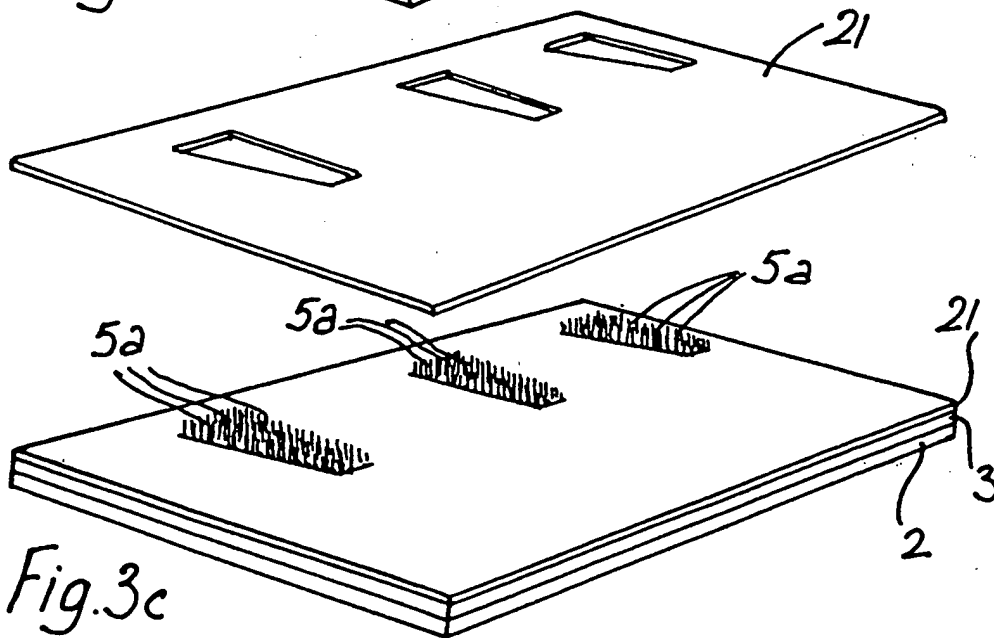
20 30. A method as claimed in claim 29 including the step, prior to welding, of interposing a layer of foam or the like material between the base layer of the applique and the fabric support.

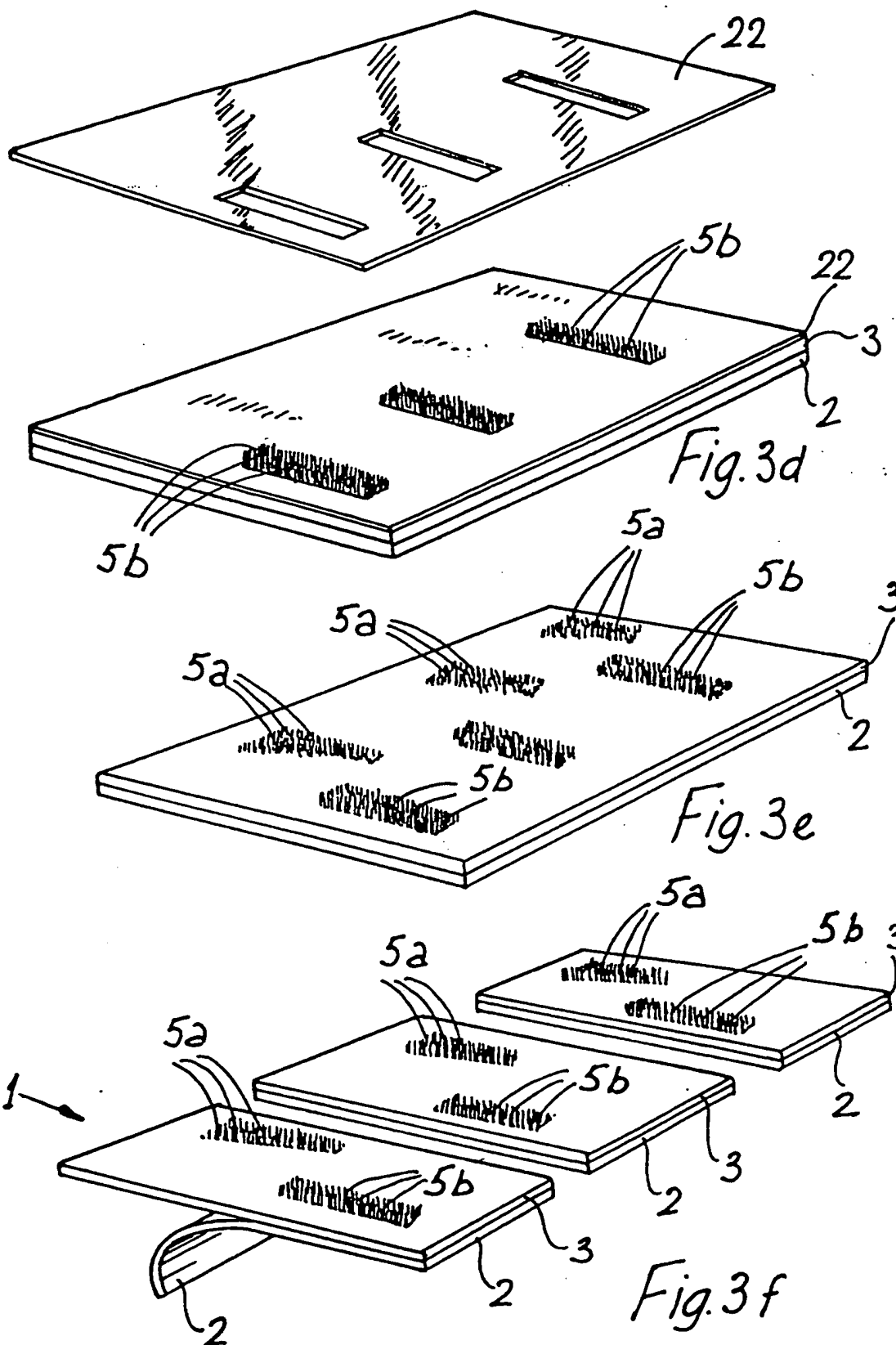
31. A method of applying an applique substantially as hereinbefore described with reference to the accompanying drawings.

25 32. A fabric support having an applique applied thereto by a method as claimed in any of claims 28 to 30.

*Fig. 1**Fig. 2*



*Fig. 3a**Fig. 3b**Fig. 3c*



# A. CLASSIFICATION OF SUBJECT MATTER

IPC : D06Q 1/14, B32B 5/08

According to International Patent Classification (IPC) or to both national classification and IPC

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Minimum documentation searched (classification system followed by classification symbols)

IPC : D06Q, B32B

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RM25, EPODOC, WPI

# C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB, A, 2010123 (COMIND SPA AZIENDA STARS), 27 June 1979 (27.06.79), page 2, line 49 - line 116, figure 2, abstract, claims	1,6,13,18, 29-30
X	US, A, 5059452 (WILLIAM J. SQUIRES), 22 October 1991 (22.10.91), column 2, line 47 - line 58, figure 1, abstract, claims	1-3,18-19
A	US, A, 4652478 (VOLKER MAÜ), 24 March 1987 (24.03.87)	1-32

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A	GB, A, 2245220 (ELECTROSCOPE LIMITED), 2 January 1992 (02.01.92)  --	1-32
A	FR, A1, 2659094 (SOCIETE D'ENDUCTION ET DE FLOCKAGE), 6 Sept 1991 (06.09.91)  -- -----	1-32

## INTERNATIONAL SEARCH REPORT

Information on patent family members

07/05/94

International application No.

PCT/IE 94/00008

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
GB-A-	2010123	27/06/79	DE-A-	2854013	28/06/79
			FR-A-	2411702	13/07/79
-----					
US-A-	5059452	22/10/91	US-A-	4895748	23/01/90
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US-A-	4652478	24/03/87	DE-C-	3502990	05/06/86
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